Pseudomonas and Pedobacter isolates from King George Island inhibited the growth of foodborne pathogens

Abstract

This report describes the isolation and characterization of bacterial isolates that produce anti-microbial compounds from one of the South Shetland Islands, King George Island, Antarctica. Of a total 2465 bacterial isolates recovered from the soil samples, six (BG5, MTC3, WEK1, WEA1, MA2 and CG21) demonstrated inhibitory effects on the growth of one or more Gram-negative or Gram-positive indicator foodborne pathogens (i.e. Escherichia coli 0157: H7, Salmonella spp., Klebsiella pneumoniae, Enterobacter cloacae, Vibrio parahaemolyticus and Bacillus cereus). Upon examination of their 16S rRNA sequences and biochemical profiles, the six Antarctic bacterial isolates were identified as Gram-negative Pedobacter cryoconitis (BG5), Pseudomonas migulae (WEK1), P. corrugata (WEA1) and Pseudomonas spp. (MTC3, MA2, and CG21). While inhibitors produced by strains BG5, MTC3 and CG21 were sensitive to protease treatment, those produced by strains WEK1, WEA1, and MA2 were insensitive to catalase, lipase, alpha-amylase, and protease enzymes. In addtion, the six Antarctic bacterial isolates appeared to be resistant to multiple antibiotics.